

K Reactor Seepage Basin

Background

The K Area Reactor Seepage Basin (KRSB) is located west of K Reactor in the south-central part of the Savannah River Site (SRS). It was constructed to receive radioactively contaminated purge water from the reactor's disassembly basin.

The KRSB was used from 1957 to 1969. Process purge water was released to the basin, via a buried 600-foot-long, 3-inch diameter polyethylene pipeline, to allow a significant portion of the tritium to decay before the water outcropped to surface streams. In addition to tritium and low levels of other radionuclides, the purge water might have also contained trace amounts of non-radioactive organic and inorganic substances and detergents.

Environmental Concerns

In 1978, sediment and soil samples were collected from a test boring in the basin. Cobalt-60, strontium-90, and cesium-137 were detected at elevated levels above basin background in the sediment samples.

In 1984, four groundwater monitoring wells were installed surrounding the basin. Since 1985, tritium has consistently been reported above the drinking water standards.

In 1995, SRS performed field characterization activities to support preparation of the Remedial Investigation/Baseline Risk Assessment. The results confirmed the presence of five radionuclides: cesium-137, strontium-90, plutonium-239/240, americium-241, and cobalt-60, at levels that pose unacceptable human health risks. No ecological constituents of concern were identified.

Environmental Remedial Actions and Plans

In March 1999, SRS submitted a Plug-In Record of Decision (ROD) document to the United States Environmental Protection Agency (USEPA) and the South Carolina Department of Health and Environmental Control (SCDHEC) for review and approval. The Plug-In ROD was later approved and issued. The Plug-in ROD selected five components of a common plug-in remedy. The five components included: *in-situ* stabilization of the basin soils with a cement based grout, grouting the pipeline, soil consolidation, a low-permeability soil cover system, and institutional controls. The KRSB was the first of four reactor basins to have remediation activities completed under the Plug-In ROD with all components of the Plug-In ROD finished by November 2003.

In total, the pipeline was filled with grout, 200 *in-situ* cells were grouted with a dual-auger mixer, soils consolidated, a low permeability soil cover system installed, and institutional controls placed at the waste site. A Post Construction Report was submitted to the USEPA and SCDHEC and approved in September 2002. The report documented completion of the remedial actions and described post-closure maintenance.